

KANEKEVICH, M. I.										PROCESSES AND PROPERTIES - MOF									
CA										116									
<p>Immunobiological state of scalded patients immediately after the accident. M. I. Kanekevich. <i>MM. resp.</i> (Ukraine) 1980, No. 8, 17-23. 44-75 patients with burns. 81% showed a complete absence of agglutination, 16% showed a pos. reaction (diln. 1:50), and 4% showed a pos. reaction (diln. 1:100). Complete absence of complement was found in 22% of the patients, a low titer (0.2-0.1) in 49% and a 0.1-0.04 titer in 29% of the patients. A low phagocyte no. (0-5.0) was exhibited by 43% of the patients, 52.5% had a phagocyte no. of 5-10, and only 4.5% showed phagocyte nos. above 10. Twenty-six % of the subjects had a low opsonic index (up to 0.5), 63% had an opsonic index of 0.6-1.0, and only 11% had an opsonic index above 1.0. It is suggested that rational therapy, among other things, should attempt to stimulate immunogenesis in patients with severe burns. S. A. C.</p>																			
<p>ASM-3LA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
100000 01										100000 01									
100000 01										100000 01									

KAMNEVICH, M.I., dotsent (Khar'kov, ul. Dzerzhinskogo, 97, kv. 35)

Gastric neurinomas. Vest. khir. 74 no.5:50-53 J1-Ag '54. (MIRA 7:10)

1. Iz khirurgicheskogo otdeleniya (sav. prof. A.V.Gabay) kliniki  
Ukrainskogo tsentral'nogo nauchno-issledovatel'skogo instituta  
rentgenologii, radiologii i onkologii.

(STOMACH, neoplasms,  
neurilemmoma)

(NEURILEMMOMA,  
stomach)

KANEKOVICH, M.I., detent

Trichobezoar of the stomach. Sov.med. 20 no.12:57-59 D '56.

(MLM 10:1)

1. In onkologicheskogo otdeleniya Lipetskoy oblastnoy bol'nitsy  
(glavnyy vrach F.D.Berenin)

(BEZOAR

trichobezoar of stomach)

KANEKEVICH, M.I., dotsent (Lipetsk (obl.), ul. Suvorova, d.1. kv.15)

Tuberculosis of the stomach. Vest.khir. 80 no.4:118-121 Ap'58

(MIRA 11:5)

1. Iz onkologicheskogo otdeleniya (zav. - dotsent M.I. Kanekevich)  
Lipetskoy oblastnoy bol'nitsy (gl.vrach - F.D. Borenin).

(TUBERCULOSIS, CASTROINTESTINAL,  
stomach (Rus))

KANEKEVICH, M.I.

Clinical picture of lipoma of the stomach. Vop. onk. 5 no.12:  
725-727 159. (MIRA 13:12)  
(STOMACH—TUMORS)

KANEKSEVICH, M.I., dots.

Supernumary pancreas in the stomach wall. Khirurgia 35  
no.6:134-137 Je '59. (MIRA 12:8)

1. Iz onkologicheskogo otdeleniya (sav. - dots. M.I.Kanekevich)  
Lipetskoy oblastnoy bol'nitsy (glavnyy vrach F.D.Boronin).  
(PANCREAS, abnorm.

supernumary pancreas in stomach wall, surg.  
(Rus))  
(STOMACH  
same)

KANEKEVICH, M.I., dotsent (Lipetsk)

Accessory pancreas in the wall of the stomach. Klin.med. 37 no.11;  
82-85 N '59. (MIRA 13:3)

1. Iz onkologicheskogo otdeleniya (zaveduyushchiy - dotsent M.I.  
Kanekevich) Lipetskoy oblastnoy bol'nitsy (glavnyy vrach F.D. Boronin).  
(PANCREAS abnorm.)

KANEKO, Kenta

Breach in the American fortress. Vsem. prof. dvizh. no.8/9:18-22  
Ag-S '60. (MIRA 13:9)

1. Zaveduyushchiy meshdunarodnym otdelom Federatsii profsoyuznov  
metallicheskoy i mashinostroitel'noy promyshlennosti Yaponii.  
(Japan--Politics and government)



117 AND 118 (1968)

PROCESSES AND PROPERTIES INDEX

KANEL, E. S.

Acetic acid fermentation by a fungus of the *Rhizopus* species. E. S. Kanel. *Microbiology* (U. S. S. R.) 5, 240-241 (1966). —A fungus closely related to *Rhizopus japonicus* gave a 60% yield of lactic acid when grown on a mineral medium using 30% sugar and 4% chaff. W. C. Coker

ASAC-35.4 METALLURGICAL LITERATURE CLASSIFICATION

117 AND 118 (1968)

117 AND 118 (1968)



ALEKSANDROVA, M. (Riga); INDULEN, A. (Riga); KALNIN', B. [Kalnina, B.] (Riga);  
KANEL', I. [Kanele, I.] (Riga); KONDRASHOVA, M. (Riga); KUKAIN, R.  
[Kukainis, R.] (Riga)

Virological and serologic studies in connection with the inoculation  
with live vaccine against poliomyelitis in Latvia; a preliminary  
report. Vestis Latv ak no.2:149-152 '60. (EEAI 10:1)

1. Akademiya nauk Latvyskoy SSR, Institut mikrobiologii.  
(LATVIA--POLIOMYELITIS)

ALEKSANDROVA, M.; GINTER, V.[Gintere, V.]; INDULEN, M.[Insulena, M.];  
KANEL', I.[Kanele, I.]; KONDRASHOVA, M.; KUKAYN, G.[Kukaine, G.]

Virological and serologic studies of live vaccine against polio-  
myelitis. Report II. Vestis Latv ak no.6:153-158 '60.  
(EEAI 10:9)

(POLIOMYELITIS) (VACCINES AND VACCINATION)

INDULEN, M. [Indulena, M.]; KANEL', I. [Kanele, I.]

Etiological role of enteroviruses in intestinal disorders  
in children. Vestis Latv ak no.6:115-118 '62.

1. Institut mikrobiologii AN Latvyskoy SSR.

KANEL', I. [Kanele, I.]

Effectiveness of the immunization with live vaccine of children  
previously vaccinated with Salk vaccine. Vestis Latv ak no.7:107-  
110 '62.

1. Institut mikrobiologii AN Latvyskoy SSR.

KUKAYN, R. [Kukaine, R.]; INDULEN, M. [Indulēna, M.]; KANEL', I. [Kanelo, I.];  
KONDRASHOVA, M.; KALNINYA, B. [Kalnina, V.]; VOLRAT, A. [Volrate, A.];  
FELDMAN, G. [Feldmane, G.]; NAGAYEVA, L.; PAVLOVA, M.; POPOVA, V.

Characteristics of the tuberculin tests in children inoculated  
during early infancy with ~~p~~Foral BCG vaccine and live poliomyelitis  
vaccine. Vestis Latv ak no.7:115-117 '62.

1. Institut mikrobiologii AN Latvyskoy SSR.

KANEL I.A.

BERZIN', V.K.; OLINSKAYA, Ye.V.; KANEL', I.A.

Result of a mass Schick's test in determining immunity to diphtheria in children in Riga during 1951. Zhur.mikrobiol.epid. i immun. no.8: (MLRA 7:9) 76-79 Ag 154.

1. In Rishskogo meditsinskogo instituta (dir. prov. E.M.Burtniek)  
i Rishskoy gorodskoy sanitarno-epidemiologicheskoy stantsii (glavnyy vrach M.N.Popova)

(DIPHTHERIA, immunology.

Schick test, results in Latvia)



PANEL', I.A. Gen Med Sci--(dis) "Changes in the histological flora of  
the intestines in certain infectious diseases of children." Riga, 1958.  
14 pp (Acad Sci Lat SSR. Inst of Paediatrics), 200 copies  
(M, 31-52, 107)

-14-

INDULEN, M.K. [Indulens, M.]; KANEL', I.A. [Kanelis, I.]

Study of the population of Riga for the presence in the blood of antibodies to the ECHO group of viruses. Vop.virus 7 no.5:547-551 S-O '62. (MIRA 15:11)

1. Institut mikrobiologii AN Latvyskoy SSR, Riga.  
(ECHO VIRUSES)  
(RIGA--BLOOD--EXAMINATION)  
(ANTIGENS AND ANTIBODIES)

KANEL', L. V.  
25891

Obzor Dokladov Po Tuberkulezu Na  
Sele. (Na sessii In-Ta Tuberkuleza  
Akad. Med Nauk SSSR. Dek., 1947, G.)  
Byulleten' In-Ta Tuberkuleza Akad. Med. Nauk.  
SSSR, 1948, No. 1, s. 38-44

SO: LETOPIS NO. 30, 1918

KANEL', L. V.

Tuberculosis

"Tuberculosis." F. A. Mikhailov; Reviewed by L. V. Kanel'; Probl. tub. no. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, May 1952. UNCLASSIFIED.

L 21223-66 EWT(m)/EWP(t) IJP(c), JD  
ACC NR: AP6003817 SOURCE CODE: UR/0181/66/008/001/0283/0294

AUTHORS: Kanel's, O. M.; Kraftmakher, Ya. A.

ORG: none

TITLE: Formation of vacancies in zirconium, 17

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 283-284

TOPIC TAGS: zirconium, crystal lattice vacancy, photoresistance, emissivity, specific heat

ABSTRACT: To determine the energy of formation and concentration of vacancies in zirconium, the authors measured its specific heat high temperatures. Zirconium iodide samples were used in the form of ribbons 0.1 mm thick, 0.5 -- 1 mm wide, and up to 100 mm long. The measurements were made by a modulation method described earlier (PMTF, no. 5, 176, 1962), except that the amplitude of the temperature oscillations was determined from oscillations of its luminosity with the aid of a photoresistance. The sample temperature was calculated from the power radiated on the basis of data on total

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L 21223-66

ACC NR: AP6003817

emissivity of zirconium at high temperatures. The measurements were made in vacuum ( $2 \times 10^{-6}$  mm Hg), and the temperature modulation frequency was approximately 30 cps. The specific heat was measured in the temperature interval 1300 -- 200K. At temperatures above 1500°, an increase is observed in the specific heat, connected with the formation of vacancies. It is deduced from the experiments that the average energy of vacancy formation is 1.75 ev, accurate to 0.2 ev. The increase in specific heat as a result of vacancy formation is 0.8 cal/g-at-deg at 200K. The concentration of the vacancies reaches 0.7% at the melting temperature. The results obtained do not contradict earlier data on self-diffusion in zirconium. The authors thank B. G. Strelkov for interest in the work and valuable remarks, and A. I. Baykov for supplying the samples. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 09Aug65/ ORIG REF: 004/ OTH REF: 002

Card 2/2

KANEL', Ya.I. (Moskva)

Stabilization of solutions of the Cauchy problem for equations in  
the theory of combustion. Mat. sbor. 59 (dop.):245-288 '62.  
(MIRA 16:6)

(Boundary value problems) (Differential equations)

S/020/63/149/002/027/028  
B101/B144

AUTHOR: Kanel', Ya. I.

TITLE: Stationary solution of the system of equations for the theory of combustion

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 2, 1963, 367 - 369

TEXT: For the unidimensional combustion process of a gas mixture we may write:  $\partial u / \partial t - \partial^2 u / \partial x^2 = f(u)v$ ;  $\partial v / \partial t - \lambda \partial^2 v / \partial x^2 = -f(u)v$  (1), where  $u$  is the temperature of the mixture;  $v$  the concentration of the active agent;  $f(u)v$  the reaction rate;  $f(u) = 0$ , if  $u < \alpha$ ;  $f(u) > 0$ , if  $u > \alpha$ ;  $\lambda = D\rho c/k$ ;  $D$  is the coefficient of diffusion;  $\rho$  is the density of the substance;  $c$  is its specific heat;  $k$  is the coefficient of thermal conductivity. The stationary solution of (1) has the shape:  $u = \tilde{u}(x + mt + C)$ ;  $v = \tilde{v}(x + mt + C)$  (2), where  $m = \text{const} \geq 0$ ;  $C = \text{const}$ ;  $\tilde{u}(-\infty) = u_- < \alpha$ ;  $\tilde{u}(+\infty) = u_+ > \alpha$ ;  $\tilde{v}(-\infty) = v_- > 0$ ;  $\tilde{v}(+\infty) = 0$ .

It is proved that a stationary solution of (1) exists at arbitrary  $\lambda > 0$  and that the solution at  $0 < \lambda < 1$  is unique. By inserting  $f = \tau + mt$ ;  $du/df = p$ , the following system is obtained:  $dp/du = m - f(u)v/p$ .

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S/020/63/149/02/027/028  
B101/B144

Stationary solution of the ...

$dv/du = (m/\lambda p)(u + v - u_+) - 1/\lambda$  (4). The following conditions are valid:  $v|_{u=u_-} = v_-$ ;  $v|_{u=u_+} = 0$ ;  $p|_{u=u_+} = 0$  (5). The second equation of the system (4) has the solution:  $v(u, m) =$

$$v(u, m) = u_+ - u + (1/\lambda - 1) \int_u^{u_+} \exp\left[-(m/\lambda) \int_u^{u_2} du_1/p(u_1, m)\right] du_2 \quad (6).$$

Therefrom it follows that with  $u < u_+$  in the neighborhood of  $u_+$  the following inequalities are valid:  $u_+ - u < v < (1/\lambda)(u_+ - u)$  with  $\lambda < 1$ ;  $(1/\lambda)(u_+ - u) < v < u_+ - u$  with  $\lambda > 1$ ;  $p_1(u, m) < p_2(u, m)$  with  $\lambda < 1$ , and  $p_2(u, m) < p(u, m) < p_1(u, m)$  with  $\lambda > 1$ . Thus the solution of  $p = p(u, m)$ ,  $v = v(u, m)$  is valid for the entire interval  $u_- < u < u_+$ . For  $\lambda < 1$ , the value of  $m_0$  is unique.

PRESENTED: September 6, 1962, by Ya. B. Zel'dovich, Academician

SUBMITTED: April 11, 1962

Card 2/2

L 13002-63 EWT(d)/FCC(u)/BDS AFFTC IJP(C)  
 8/0042/63/018/002/0127/0134  
 57  
 ACCESSION NR: AP3001419

AUTHOR: Kanel', Ya. I.

TITLE: Stabilization of solutions of the Cauchy problem for linear parabolic equations

SOURCE: Uspekhi matematicheskikh nauk, v. 18, no. 2, 1962 127-134

TOPIC TAGS: stabilization, Cauchy problem, Markov process equation, parabolic partial differential equation

ABSTRACT: Consider the solution  $u(x, t)$  of the Cauchy problem in the half-plane  $t$  greater than 0 for the equations (1) and (2) in the enclosure. The author studies the behavior of  $u(x, t)$  as  $t$  becomes infinite. He assumes that the function after (2) in the enclosure is continuous and bounded in the half-plane  $t$  greater than or equal to 0. With no further restrictions, the function  $u$  sub 0 of  $x$  is assumed measurable and bounded. The basic result of this paper is given in theorem 1 (see the enclosure). Orig. art. has: 20 formulas.

ASSOCIATION: none

SUBMITTED: 15Feb61

SUB CODE: 00

Card 1/1

DATE ACQ: 27May63  
 NO REF SOV: 012

ENCL: 02  
 OTHER: 002

$\frac{1}{2} \frac{d}{dt} \left( \frac{a(t)}{b(t)} \right) = \frac{a'(t)b(t) - a(t)b'(t)}{2b^2(t)}$   $\frac{1}{2} \frac{d}{dt} \left( \frac{a(t)}{b(t)} \right) = \frac{a'(t)b(t) - a(t)b'(t)}{2b^2(t)}$

... of solutions ...

Matematicheskii sbornik, v. 65, no. 3, 1960, 197-198

... combustion ... flame velocity

An infinitely long pipe is filled with a fluid ... a portion of

... of length  $\alpha$ . The author studies

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = F(u) \quad (1)$$

subject to  $u|_{t=0} = u_0(x) \quad (2)$

Here  $F(u)$  is a sufficiently smooth function and

$$F(u) = 0 \text{ for } 0 < u < \alpha < 1, F(1) = 0, F(u) > 0 \text{ for } \alpha < u < 1 \quad (3)$$

$u(t, x)$  corresponds to the temperature of the fluid ... The author shows that one can find numbers  $\ell_1$  and  $\ell_2$  such that  $u, x, t \rightarrow 0$  as

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L 15155-65

ADDRESS IN NR: APL049381

$t \rightarrow \infty$  if  $\ell < \ell_1$ , and  $u(x,t) \rightarrow 1$  as  $t \rightarrow \infty$  if  $\ell > \ell_1$ . It is assumed that  $u_0(x) \rightarrow 1$  as  $x \rightarrow \infty$ .  
 When  $\ell < \ell_1$ , the combustion process dies out and after  $\ell > \ell_1$  it continues to burn. When  $\ell < \ell_1$ , combustion of a mixture of gases of equal molecular weight is considered.

Suppose  $f(u)$  satisfies (1), and  $u_0(x)$  has the form (4), where

$$k > \frac{\pi}{2\sqrt{k}} + \frac{\bar{\alpha}}{\sqrt{k}(u_0 - \bar{\alpha})}, \quad (5)$$

$k = \frac{F(y_0)}{1 - y_0}$ ,  $\bar{\alpha} < \bar{\alpha} < y_0 < 1$ , the numbers  $\bar{\alpha}$  and  $y_0$  are such that  $k(u - \bar{\alpha}) < F(u)$  for  $u \in [\bar{\alpha}, y_0]$ . Then the solution  $y(x,t)$  of (1)-(2) goes to one as  $t \rightarrow \infty$  uniformly on each finite interval. The author proves an existence theorem for

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = f(u), \quad \frac{\partial u}{\partial t} = \lambda \frac{\partial^2 u}{\partial x^2}, \quad (6)$$

$$u|_{t=0} = u_0(x), \quad u|_{t=\infty} = u_0(x), \quad (7)$$

which is a generalization in combustion theory. He also proves Theorem 3: Let  $u(x,t)$ ,  $v(x,t)$  be bounded solutions of (6)-(7) in any strip  $-\infty < x < \infty$ ,  $0 < t < \infty$ .

REF ID: APL049381

$$u_0(x) = 1 \text{ for } |x| < l, \quad u_0(x) = 0 \text{ for } |x| > l, \\ v_0(x) = 1 \text{ for } |x| > l, \quad 0 \leq v_0(x) \leq 1 \text{ for } |x| = l, \quad (8)$$

$$l < a \sqrt{\frac{\pi}{2q}}, \quad q = \sup_{a > 0} \frac{l(u)}{u}$$

then  $u(x, t), v(x, t) \rightarrow 1$  as  $t \rightarrow \infty$ , and convergence is uniform in  $x$  on the whole real line. Orig. art. has: 35 formulas.

ASSOCIATION: none

ENCL: 00

DATE: 19Jul63

OTHER: 000

SUB CODE: MA, FP

NO REF SOV: 009

Card 3/3

16.3500

S/020/60/132/02/07/067

AUTHOR: Kanel', Ya. J.

TITLE: The Behavior of Solutions to Cauchy Problem With Time Increasing Indefinitely in the Case of Quasilinear Equations Encountered in the Theory of Burning

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 2, pp. 268-271

TEXT: Let the Cauchy problem

$$(1) \quad \frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = F(u)$$

$$(2) \quad u|_{t=0} = 0 \text{ for } x < 0, \quad u|_{t=0} = 1 \text{ for } x > 0$$

be considered. Let the function  $F(u)$  be defined on  $0 \leq u < 1$  and continuously differentiable and it is

$$(3) \quad F(0) = F(1) = 0$$

$$(5) \quad F(u) > 0 \text{ for } \alpha < u < 1; \quad F'(1) < 0$$

$$(7) \quad F(u) \leq 0 \text{ for } 0 < u < \alpha < 1; \quad F(u) \leq 0 \text{ for } 0 < u < \alpha_1 \leq \alpha$$

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S/020/60/132/02/07/067

The Behavior of Solutions to Cauchy Problem With Time Increasing Indefinitely in the Case of Quasilinear Equations Encountered in the Theory of Burning

$$\int_0^1 F(u) du > 0$$

Theorem: Let  $u(x, t)$  be the solution of (1) - (2), where  $F(u)$  satisfies the conditions (3), (5), (7). Then it holds uniformly in  $x$ ,  $-\infty < x < +\infty$ ,

$$|\tilde{u}(x + mt + C_0) - u(x, t)| \rightarrow 0$$

for  $t \rightarrow \infty$ , where  $C_0 = \text{const.}$

The function  $\tilde{u}(x + mt + C_0)$  is a so-called stationary solution of (1) which satisfies the conditions

$$(6) \quad \lim_{x \rightarrow -\infty} \tilde{u} = 0, \quad \lim_{x \rightarrow \infty} \tilde{u} = 1.$$

The author thanks Professor O. A. Oleynik for advices.

There are 6 references: 5 Soviet and 1 American.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova  
(Moscow State University imeni M. V. Lomonosov)

PRESENTED: January 12, 1960, by J. G. Petrovskiy, Academician

SUBMITTED: January 11, 1960

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89601

S/020/61/136/002/004/034  
C 111/ C 333

/6.350

AUTHOR: Kanel', Ya. I.

TITLE: ~~Certain Problems~~ Relative to Some Equations in the Theory of Burning

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 2, pp. 277-280

TEXT: In the theory of burning the problem

$$(1) \quad \partial u / \partial t - \partial^2 u / \partial x^2 = F(u)$$

$$(2) \quad u|_{t=0} = u_0(x)$$

is considered.

In the present paper the author investigates the behavior of the solution of (1) - (2) for  $t \rightarrow \infty$ ; he supposes sufficient smoothness of  $F(u)$ .

Theorem 1: Let  $u(x, t)$  be solution of (1) - (2), where

$$(3) \quad F(0) = F(1) = 0; F(u) \leq 0 \text{ for } 0 < u < \alpha < 1,$$

$$\text{Card } F'(u) \leq 0 \text{ for } 0 < u < \alpha_0 \leq \alpha; F(u) > 0 \text{ for } \alpha < u < 1;$$



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S/020/61/136/002/004/034

C 111/ C 333

Certain Problems Relative to Some Equations in the Theory of Burning

$$F'(1) < 0; \int_0^1 F(u) du > 0,$$

$u_0(x)$  is non-decreasing, and where for certain  $x_1 \leq x_2$  it holds

$$(4) u_0(x) = 0 \text{ for } x < x_1; u_0(x) = 1 \text{ for } x > x_2.$$

Let  $\tilde{u}(x+mt+c)$  be stationary solution of (1). Then for a  $C = C^0$  it holds  $|u(x,t) - \tilde{u}(x+mt+c)| \rightarrow 0$  for  $t \rightarrow \infty$  uniformly in  $x$  which varies on the whole numerical line.

$u_0(x)$  is called disturbed stationary solution, if  $u_0(x) = u_0(x+c_0(x))$ , where  $c_0(x)$  is a function of bounded variation on  $-\infty < x < \infty$ .

Theorem 2: Let  $F(u)$  satisfy (3) or

$$(14) F(0) = F(1) = 0; F'(0) > 0; F'(1) < 0;$$

$$F'(u) \leq F'(0); F(u) > 0 \text{ for } 0 < u < 1.$$

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S/020/61/136/002/004/034  
C 111/ C 333

Certain Problems Relative to Some Equations in the Theory of Burning  
Let the disturbed stationary solution  $u_0(x)$  be either non-decreasing or let  $|[u_0(x) - \tilde{u}(x)]/\tilde{u}'(x)| < \varepsilon$ , where  $\varepsilon$  is sufficiently small. Then it holds the conclusion of theorem 1.

Theorem 3: Let  $F(u)$  satisfy (3); assume that  $u_0(x) = \tilde{u}(x) + v_0(x)$  satisfies the conditions of theorem 2;  $v_0(x) \geq 0$  ( $\leq 0$ );  $v_0(x) > 0$  ( $< 0$ ) on an interval. Then the solution of (1) - (2) tends for  $t \rightarrow \infty$  to the "displaced" stationary solution  $\tilde{u}(x+C)$ , where  $C > 0$  ( $< 0$ ).

Theorem 4: Let  $F(u)$  satisfy (14); let  $u(x, t)$ ,  $v(x, t)$  be solutions of Cauchy problem for (1) with initial functions  $u_0(x)$  and  $v_0(x)$ . Let  $0 \leq u_0$ ,  $v_0 \leq 1$ ,  $u_0 - v_0 = 0 \exp(1/2 mx - \varepsilon |x|^\alpha)$  for  $x \rightarrow -\infty$ , where  $\varepsilon > 0$ ,  $1/2 < \alpha \leq 1$ , and let  $\tilde{u}(x+C') < u < \tilde{u}(x+C'')$ ,  $u(x+C') < u < u(x+C'')$  for certain  $C'$ ,  $C'' = \text{const}$ . Then  $|u(x, t) - v(x, t)| \rightarrow 0$  for  $t \rightarrow \infty$  uniformly in  $x$ ,  $-\infty < x < \infty$ .

Theorem 5: Let  $F(x)$  satisfy (3);  $F(u) = 0$  for  $0 < u < \infty$ ;  $\alpha < \bar{u} < y < 1$ ; for  $\bar{u} < u < y$ , let  $F(u) > k(u - \bar{u})$ , where  $k = F(y_0)/y_0(y_0 - \bar{u})$ .  $u_0(x)$  is assumed to have the form

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89601

S/020/61/136/002/004/034  
C 111/ C 333

Certain Problems Relative to Some Equations in the Theory of Burning

(16)  $u_0(x) = 0$  for  $|x| > 1$ ;  $u_0(x) = 1$  for  $|x| < 1$ , where

$$1 > \frac{\pi}{2} \sqrt{k + \bar{\alpha}} / \sqrt{k} (y_0 - \bar{\alpha}).$$

Then  $u(x, t) \rightarrow 1$  for  $t \rightarrow \infty$ .

Theorem 6: Let  $F(u) > 0$  for  $0 < u < 1$ ;  $F(1) = 0$ ;  $F'(0) + F(0) > 0$ ;  $u_0(x) > 0$  on an interval. Then  $u(x, t) \rightarrow 0$  for  $t \rightarrow \infty$ .

Theorem 7: Let  $F(u)$  satisfy (3); let  $u_0(x)$  have the form (16), where  $1 < \sqrt{\pi/2q} \leq q = \sup [F/u]$ ,  $0 \leq u \leq 1$ . Then  $u(x, t) \rightarrow 0$  for  $t \rightarrow \infty$ .

The author mentions Bernshteyn.

There are 10 references: 8 Soviet and 2 American.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: July 25, 1960, by J. G. Petrovskiy, Academician  
SUBMITTED: July 23, 1960 Card 4/4

KANEL', Ya. I.

Cand Phys-Math Sci - (diss) "Behavior of the solution of equations of the combustion theory given large values for time." Novosibirsk, 1961. 8 pp; (Academy of Sciences USSR, Siberian Division, Joint Academic Council for Phys-Math and Tech Sci); 160 copies; price not given; bibliography on p 8 (11 entries); (KL, 7-61 sup, 219)

KANEL, YA. I.

AID Nr. 976-9 24 May

STABILIZATION OF SOLUTIONS OF A CAUCHY PROBLEM FOR EQUATIONS  
ON THE THEORY OF COMBUSTION (USSR)

Kanel, Ya. I. Matematicheskiy sbornik, v. 59(101), 1962, 245-288.  
S/039/62/059/000/010/011

The behavior of a solution of the Cauchy problem as  $t \rightarrow \infty$  in the half-plane  
 $t > 0$  for the equation

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = F(u), \quad (1)$$

Card 1/3

AID Nr. 976-9

24 May

STABILIZATION OF SOLUTIONS (Cont'd)

3/039/62/059/000/010/011

with the initial condition  $u|_{t=0} = u_0(x)$  is studied under the assumption that  $F(u)$ , satisfies the following conditions:

$$\left. \begin{aligned} F(0) = F(1) = 0, F(u) \leq 0 \text{ at } 0 < u < \alpha < 1, \\ F(u) > 0 \text{ at } \alpha < u < 1, \int_0^1 F(u) du \geq 0. \end{aligned} \right\} \quad (2)$$

The solution of (1) of the form  $u(x, t) = \tilde{u}(x+mt+C)$ , where  $m = \text{const}$  and  $C = \text{const}$ , is called stationary (stationary wave). It is proved that such a solution exists under conditions (2). Assuming that  $F(u)$  satisfies conditions (2), that  $F'(u)$  is nonpositive on the interval  $0 < u < 1$ , that the initial function  $u_0(x)$  is nondecreasing, and that  $u_0(x) = 0$  at  $x < x_2$  and  $u_0(x) = 1$  at  $x > x_2$  it is proved that the solution of the Cauchy problem for equation (1) as  $t \rightarrow \infty$  tends uniformly with respect to  $(x)$  toward a stationary solution on the entire  $x$ -axis. Under some conditions for  $F(u)$  and  $u_0(x)$  it is also

Card 2/3

. STABILIZATION OF SOLUTIONS (Cont'd)

8/039/62/059/000/010/011

shown that the solution of (1) with respect to (t) tends uniformly toward zero as  $x \rightarrow -\infty$ , and towards unity as  $x \rightarrow +\infty$ ; its derivative tends toward zero as  $x \rightarrow \pm \infty$ . Stability conditions of a stationary solution under certain perturbations are established.

[LK]

Card 3/3

KANELIS, St.

Technical and economic indicators, a means of checking the efficacy of industrial investments. Probleme econ 16 no.6: 145-146 Je '63.

1. Director tehnic, Institutul de proiectari chimice.



KANAL'SKAYA, K. ....

Labor and Laboring Classes - Education

Source of knowledge. Klub no. 5, '51

Monthly List of Russian Accessions. Library of Congress, August 1952. Unclassified.

1. KANEL'SKAYA, M.
2. USSR (600)
4. Libraries
7. One of many, Klub 2 No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953. Uncl.

1. KANEMAN, T.YU. I.S.: KHCODUKIN, N.T.: LYSUNKINA, V.A:
2. USSR (600)
4. Asia, Central - Hemorrhagic Fever
7. Search for carriers of hemorrhagic fever in Central Asia. Vop. kraev.pat. no. 2. 1952

- February*
9. SOURCE: Monthly List of Russian Accessions, Library of Congress, ~~March~~, 1953. Uncl.

KANEP, S.V.

Correlative structure of the skull in the vole *Microtus*  
(*Microtus*) *ungurensis* Kastschenko (1913). Zool.zhur. 44  
no.11:1706-1711 '65. (MIRA 18:12)

1. Kafedra zoologii pozvonochnykh Leningradskogo gosudarstven-  
nogo universiteta.

KANEP, S.V.

Geographical and age-related changes in the green toad. Vest. LGU  
18 no.9:161-164 '63. (MIRA 16:6)

(Toads) (Growth)

KANEV, S.V.

Geographical variation of the growth of organs in the grass frog.  
Prim. mat. metod. v biol. no.3:86-94 '84. (MIRA 17:11)

1. Leningradskiy universitet.

KANEP, S.V.

Interspecific geographical variation of common (*Microtus arvalis*) and  
Transcaspian (*Microtus transcaspicus*) voles. Vest. LGU 19 no.3:  
174-177 '64. (MIRA 17:3)

KANEP, S.V.

Allometric growth of the internal organs of a grass frog. Vest.  
LOU 17 no.15:126-129 '62. (MIRA 15:8)  
(Growth) (Frogs) (Viscera)



KANEPAYA, A.

Q-2

USSR / Farm Animals. Cattle

Abs Jour : Ref Zhur-Biol., No 6, 1958, 26125

Author : Kanopaya A., Tsosyulovich I.

Inst : Not given

Title : The Change of Composition and Properties of Butterfat during Lactation (Izmeneniye sostava i svoystv zhira moloka v tochniye laktatsii)

Orig Pub : Sb. stud. nauchno-issled. rabot. Latv.s.-kh. akad, 1957, vyp.1, 101-104

Abstract : The effect of the conditions of feeding and the period of lactation upon the composition and physicochemical properties of butterfat was studied at the training farm "Ramava" on 6 contemporary cows of the Brown Latvian breed. It was found that in the main period of lactation, under stable man-

Card 1/2

USSR / Farm Animals. Cattle.

Q-2

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000520410004-

Abstract : Goment and with the providing of cows with succulent rations, the butterfat composition did not diverge from the established average norms. On the transfer of cows to pasture maintenance, the average percentage of butterfat increased (from 3.87% in March to 4.2% in May). The number of large fat globules also increased.

Card 2/2

12

VETRA, R.; KANEPE, V., red.; KIRULE, E., tekhn. red.

[Sugulda; a tourist guidebook] Sugulda; atkartots un papildinats  
izdevums. Riga, Latvijas Valsts izdevnieciba, 1960. 102 p.  
(MIRA 14:12)

(Sigulda region--Description and travel)

KANEPE, V., red.; AIZUPIETE, M., tekhn. red.

[Let us visit Zemgale! Sightseeing tours] Apcelosim Zemgali; turisma  
marsruti. Atkartots un papildinats izdevums. Riga, Latvijas Valsts  
izdevnieciba, 1960. 189 p. [In Latvian] (MIRA 14:12)  
(Zemgale--Description and travels)

GOLDINS, V.; STREBEIKO, K.[translator]; MACULEVICS, M., spets. red.;  
KANEPE, V., red.; VASILEVSKA, L., tekhn. red.

[Riga; a short reference book] Riga; isas izzinas. Riga, Latvijas Valsts izdevnieciba, 1960. 279 p. [In Latvian]  
(MIRA 15:1)

(Riga—Directories)

KANEPS, G., st. nauchn. sotr.; UZNAINS, V., prepodavatel';  
BRANKA, V., red.

[Mechanization of livestock farming] Lopkopibas darbu  
mehanizacija. Riga, Latvijas Valsts izdevnieciba, 1964.  
152 p. [In Latvian] (MIRA 18:7)

1. Nauchno-issledovatel'skiy institut shkol pri Minister-  
stve obrazovaniya (for Kaneps).

KANER B.L.

94-4-17/25

**AUTHOR:** Kireyev, M.I., Engineer

**TITLE:** Scientific-technical Conference on Problems of Static Electricity (Nauchno-tekhnicheskoye soveshchaniye po bor'be so staticheskim elektrichestvom)

**PERIODICAL:** Promyshlennaya Energetika, 1958, Vol.13, no.4, pp. 32 - 3 (USSR).

**ABSTRACT:** The Central Management of the All-Union Chemical Society imeni D.I. Mendeleev (Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleeva), together with the Ministry of the Chemical Industry of the USSR (Ministerstvo khimicheskoy promyshlennosti SSSR), called a scientific-technical conference on problems of static electricity. The conference met in Moscow on December 16 - 18, 1957 and six reports were read. Prof. I.B. Roysen gave a mainly theoretical report on static electricity and methods of dealing with it. Candidate of Technical Sciences V.S. Medvedeva dealt with the ionisation of air by means of radio-active substances. Engineer A.V. Beletsvetov described the construction of radio-active ionisers. Senior Scientific Assistant Borisov indicated present practice in lightning protection. A proposed standard for protection against static electricity and secondary effects of lightning

Card 1/2

KANER, B.L., inzh (Moskva)

Regulations governing safety measures in dealing with static  
electricity in the chemical industries. Elektrichestvo  
no.1:77-81 Ja '64. (MIRA 17:6)

~~KANER, B.L.;~~ KATS, M.I.

"Fundamentals of safety and fire prevention techniques in the  
chemical industry," by N.V.Solov'ev, P.I.Ermolov, N.A.Strel'chuk.  
Reviewed by B.L.Kaner, M.I.Kats. Khim. prom. no. 7:615-616  
O-M '60. (MIRA 13:12)

(Chemical industries--Safety measures)  
(Solov'ev, N.V.) (Ermolov, P.I.) (Strel'chuk, N.A.)



KANER, B.L.

Safety problems in designing plants for large-scale chemical industry.  
Bezop.truda v prom. 5 no.12:1-2 D '61. (MIRA 15:1)  
~~Chemicals~~--Manufacture and industries--Safety measures)

BOYZEN, I.S.; KANER, B.L.

Principles for the normalization of protection from static  
electricity in the chemical industry. Zhur. VKHO 7 no.6:626-632  
'62. (MIRA 15:12)

(Chemical industries—Safety measures)  
(Electrostatics)

SPEKTOR, Ye.M.; KANER, B.L.

Activity of the section for industrial safety of the Central  
Administration of the D.I.Mendeleev All-Union Chemical Society.  
Zhur.VKHO 8 no.1:110-111 '63. (MIRA 16:4)  
(Chemical society) (Industrial safety)

14-00000-65 Pa-4 AMD  
EXPRESSION NR: AP50031111

S/0061/61, 1009/001/01 9/0324

Author, V. L. Ruytman, K. Ya.

... fire protection and techniques of work ...  
... and operation of external ...  
are discussed. These problems are pressing because ...  
... rubber, etc., practically all specify outdoor equipment with the ...  
... The production areas ...  
... of several exterior ...  
... and auxiliary production ...  
... installations stems chiefly from ...  
tanks, condensate receivers and storage tanks. The ...  
and plant workers to keep a hand large stocks of the starting materials ...  
results from underestimating the fire hazard of compressed gases and readily ...  
flammable liquids.

ASSOCIATION: none  
SUBMITTED: 00  
NO REF SOV: 000  
Card 1/1

ENCL: 00  
OTHER: 000

SUB CODE: 01  
JPRS

FD-325

USSR/Physics - Skin effect

Card 1/1 Pub. 146-24/44

Author : Azbel', M. Ya.; Kaner E. A.

Title : Anomalous skin effect for arbitrary integral of collisions

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 876-878

Abstract : In an earlier work (M. I. Kaganov, M. Ya. Azbel', DAN SSSR, 102, 49, 1955) one of the authors obtained an expression for the surface impedance of a metal in the case of anomalous skin effect (i. e. an effect taking place at high frequencies and low temperatures, when the length of free path of electrons is large in comparison with the depth of penetration of the field into the metal); here it was assumed that the integral of collisions can be written with the aid of the relaxation time  $\tau$ , distribution function of electrons, and equilibrium Fermi distribution function. Introduction of the relaxation time can be strictly founded only for high temperatures (i. e. much greater than the Debye temperature); for lower temperatures the integral of collisions generally cannot be described in the usual form. In the present communication the authors demonstrate that the formula for impedance obtained in the above mentioned work is correct for arbitrary integral of collisions, use being made of the central symmetry of the Fermi surface. They thank I. M. Lifshits for judging the obtained results. Two references.

Submitted : July 14, 1955 - Phys. Tech. Inst, AS Ukr SSR

G-4

Category : USSR/Electricity - Conductors

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4242

Author : Azbel', M.Ya., Kaner, E.A.  
Inst : Physicotechnical Institute, Academy of Sciences Ukrainian SSR, Khar'kov  
Title : Theory of Cyclotron Resonance in Metals

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 811-814

Abstract : An investigation of the surface impedance of a metal as a function of the value of a constant magnetic field applied parallel to its surface, for arbitrary dispersion and for an arbitrary collision integral. Since the resonance impedance dip occurs at such frequencies, at which the anomalous skin effect takes place, the authors solve simultaneously Maxwell's equation and the kinetic equation in addition to the Fermi distribution function. Unlike the known "diamagnetic" resonance (using the author's terminology), which occurs in semiconductors at a single frequency, cyclotron resonance occurs in metals at many frequencies, close to multiples of the fundamental frequency. Experimental study of cyclotron resonance makes it possible in principle to determine the

Card : 1/2

G-4

Category : USSR/Electricity - Conductors

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4242

character of the cross sections of the constant-energy surfaces (closed or unclosed) the degree of filling of the energy zones, and the speed at the Fermi surface.

Card : 2/2

CARD 1 / 2

PA 1651

SUBJECT USSR / PHYSICS  
 AUTHOR KANER, E.A., KAGANOV, M.I.  
 TITLE On the Problem of the Possibility of introducing an effective Dielectricity Constant at high Frequencies.  
 PERIODICAL Zhurn.eksp.i teor.fis, 31, fasc. 3, 459 - 461 (1956)  
 Issued: 12 / 1956

The present work discusses the introduction of an effective dielectricity constant  $\epsilon_{\text{eff}} = (4\pi/cZ)^2$  within the domain of the anomalous skin effect. Here  $Z = R + iX$  denotes the surface impedance of the metal. The introduction of  $\epsilon_{\text{eff}}$  is based upon the fact, that  $Z$  practically does not depend either on the polarization of the incident wave or on the angle of incidence. According to GINSBURG this is true for  $|\epsilon'| \gg 1$ ,  $\epsilon' = \epsilon(\omega) - 4\pi i\delta/\omega$ , and is rigorously proved for such frequencies and temperatures at which the normal skin effect occurs. To the above mentioned condition there corresponds the inequation  $|\delta| \ll \lambda \delta = (c/\omega \sqrt{\epsilon'})$ ,  $\lambda = c/\omega$ , i.e. the depth of penetration of the electromagnetic field into the metal is much smaller than the wavelength in the vacuum. The latter condition holds good also in the domain of the anomalous skin effect because also in this case surface impedance does not depend on polarization and also not on the angle of incidence. Rigorous proof of this assertion is what this work intends to attain.

In accordance with the definition, it is assumed to be true that:  $Z_s = (4\pi/c)\epsilon_x(0) Z_p = -(4\pi/c) \epsilon_y(0)/H_x(0)$ . The index s corresponds to the polarization of the electric field in the plane of the metal surface, the index p corresponds to polarization in



Žurn.eksp.1 teor.fis, 31, fasc.3, 459 - 461 (1956) CARD 2/2 PA 1651

the plane of incidence. In the case of oblique incidence (at an angle of  $\varphi$ ) of an electromagnetic wave with the frequency  $\omega$  onto a half-space ( $z > 0$ ) occupied by metal expressions for the surface impedance are found on the usual assumptions of the theory of the anomalous skin effect. They are explicitly given for the following cases: For the mirror-like reflection of the electrons on the metal-vacuum boundary as well as for diffuse reflection. In the general case ( $\varphi \neq 0$ ) it holds that  $Z_s = Z_p$ , and  $Z_p$  then depends on three parameters with the dimension of one length: skin depth  $\delta$  of the penetration of the field into the metal, free length of path  $l$  of the electrons and wave length  $\lambda$  in the vacuum. The question is now investigated as to the importance of this dependence in individual cases. At all frequencies of up to  $\omega < 10^{16} \text{ sec}^{-1}$  and at any temperatures it holds that  $\lambda \gg \delta$  and  $\lambda \gg l$ , and  $Z_p = Z_s$  is obtained. Here surface impedance does not depend on the angle of incidence. Thus, the possibility of introducing an effective dielectricity constant within the entire frequency- and temperature domain is proved. In conclusion the corrections to the surface impedance, which are independent of the angle of incidence, are discussed.

INSTITUTION: Physical - Technical Institute of the Academy of Sciences of the Ukrainian USSR

KANER, E. A.

TOWARDS THE THEORY OF THE ANOMALOUS SAM

by E. A. Kaner and M. Y. Arif

U.S. Acad. Sci. 1984

Recently a large number of papers have appeared discussing

statistical interpretation of the results of the experiments on

KANER, E. A.

-51-1-9/18

AUTHORS: German, V.L. and Kaner, E.A.  
TITLE: Optical Activity with the Non-linear Effect of  
"Saturation" Taken into Account. (Opticheskaya  
aktivnost' s uchetom nelineynogo effekta "Nasyshcheniya".)  
PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.1, pp.68-72.  
(USSR).

ABSTRACT: The strong dependence of the coefficient of absorption of microwaves near resonance on the intensity of the incident radiation is well-known in radiowave spectroscopy (Refs. 1 & 2). The half-width of the resonance line is proportional to the signal power and the energy absorbed at large intensities remains constant (saturation). These non-linear effects in optics were described qualitatively by S. I. Vavilov (Ref.3). In the present paper it is shown that to observe the dependence of the absorption coefficient on the intensity it is necessary firstly, to have the frequency of the external field close to the resonance frequency and secondly, the quantity  $1/\tau^2$  should be sufficiently small ( $\tau$  = the average time in which the population of the energy levels

... are Slavic.

Card 1/3

51-1-9/18

Optical Activity with the Non-linear Effect of "Saturation" taken into Account.

ASSOCIATION: Institute of Radiophysics of Academy of Sciences of the Ukrainian SSR, Kharkov. (Institut radiofiziki AN Ukrainskoy SSR, Khar'kov.)

SUBMITTED: December 14, 1956.

AVAILABLE:

Card 3/3

G-4

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000520410004

USSR/Electricity - Conductors

Abs Jour. : Ref Zhur - Fizika, No 1, 1958, 1378

possible to determine, from experimental data, the topology of the boundary of the Fermi surface and its actual characteristics. The surface impedance of the metal is calculated for an arbitrary direction of the constant magnetic field relative to the surface. The examination was carried out also under the most general assumptions of the electron theory of metals (arbitrary law of dispersion and collision intervals); it is shown that it is possible to introduce the mean-free-path time of the electrons under conditions of anomalous spin effect at all temperatures.

Card 2/2

56-2-40/47

56-6-23/47

On the Theory of Cyclotron Resonance

are 5 references, 4 of which are Slavic.

ASSOCIATION: Institute for Radiophysics and Electronics AN Ukrainian SSR  
(Institut radiofiziki i elektroniki Akademii nauk Ukrainiskoy SSR)

SUBMITTED: June 28, 1957

AVAILABLE: Library of Congress

Card 3/3

KANER, E.A.: Master Phys-Math Sci (diss) -- "The theory of cyclotron resonance in metals". Khar'kov, 1958. 9 pp, (Min Higher Educ Ukr. SSR, Khar'kov Order of Labor Red Banner State U im A.M. Gor'kiy), 150 copies (KL, No 1, 1959, 113)

SOV/56-34-3-19/55

AUTHOR:

Kaner, E. A.

TITLE:

On the Theory of Galvanomagnetic and Thermomagnetic Effects in Metallic Films (k teorii gal'vanomagnitnykh i termomagnitnykh effektov v metallicheskih plenkakh)

PERIODICAL:

Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 658-669 (USSR)

ABSTRACT:

The electron distribution function and electric conductivity, thermal conductivity and Thomson coefficients have been determined for a metallic film located in a constant magnetic field directed at an arbitrary angle with respect to the surface of the film. No special assumptions have been made regarding the electron dispersion law.

The author assumes here that a relaxation time  $t_0(\vec{p})$  can be introduced in which case  $\vec{p}$  signifies the quasi momentum of the electron. First the posing of the problem and the solution of the kinetic equation are dealt with. The author investigates first the electric conductivity of a metal layer of the thickness  $d$  which is in a constant magnetic field. The author starts in this connection from a linearized kinetic equation for the addition  $f$  to the Fermi distribution function corresponding to equilibrium. The periodicity of  $f(z, \epsilon, \tau, p_H)$  with respect to the variable  $\tau$  with the period  $2\pi$  and the

Card 1/3

On the Theory of Galvanomagnetic and Thermomagnetic Effects in Metallic Films SOV/56-34-3-19/55

condition of the diffuse reflection of the electrons from the boundary of the film serve as limiting condition for this equation. A formula for the tensor of the effective conductivity is calculated in the next paragraph. An investigation of the limiting cases follows. The author investigates the range of the intense magnetic fields in view of comparing the results of the present theory with the experiments by Borovik and Lazarev. The law of dispersion is assumed here to be isotropic and quadratic. The formulae for the components of the tensor of the electric conductivity are specialized here for the following special cases: parallel and sufficiently intense magnetic field, parallel weak magnetic field, or sufficiently thin film and vertical field. Formulae for the specific resistance and for the Hall (Khol) field strength in a film which is in a strong magnetic field in which case electrons and holes may exist, are given in the next chapter. The resistance in a strong transversal magnetic field increases according to the same law as in massive metal, only more slowly. The last chapter deals with the thermomagnetic effects in the films and determines a correlation of the tensors of the thermal conductivity and the Thomson coefficient with the

Card 2/3



On the Theory of Galvanomagnetic and Thermomagnetic Effects in  
Metallic Films SOV/56-34-3-19/55

tensor of electric conductivity.  
There are 13 references, 5 of which are Soviet.

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainiskoy  
SSR (Institute for Radiophysics and Electronics AS Ukrainian  
SSR)

SUBMITTED: September 14, 1957

Card 3/3

SOV/56-35-4-19/52

21(9)

AUTHOR:

~~Kaner, E. A.~~

TITLE:

On Some Particular Features of Cyclotron Resonance in Metals With Non-Convex Fermi Surfaces (O nekotorykh osobennostyakh tsiklotronnogo rezonansa v metallakh s nevyukloy poverkhnost'yu Fermi)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 4, pp 962 - 964 (USSR)

ABSTRACT:

In earlier papers (Refs 1-5) Azbel' and Kaner already showed that cyclotron resonance in metals in the case of any non-quadratic dispersion law  $\epsilon(\vec{p})$  attains an extremum at Larmor frequencies  $\omega_{\text{ext}} = eH/c m_{\text{ext}}$   $= 2\pi eH/c (\partial s / \partial \epsilon)_{\text{ext}}$  ( $\Omega$ - values in elliptic points of reference - in these points of reference electron velocity is parallel to H). As to the method of denotation cf. reference 2. For the purpose of investigating Larmor resonance frequencies in the case of non-convex Fermi surfaces the Larmor resonances relating to hyperbolic reference points were not taken into

Card 1/2

On Some Particular Features of Cyclotron Resonance  
in Metals With Non-Convex Fermi Surfaces

SOV/56-35-4-12/52

account. It is shown that at Larmor frequencies near hyperbolic reference points of a non-convex Fermi surface the so-called logarithmic cyclotron resonance may occur. Cyclotron resonance at residual (extreme) Larmor frequencies in the case of non-convex Fermi surfaces shows the same peculiarities as in the case of convex surfaces (cf. Refs 1-5). As these earlier papers (Refs 1-5) contain all definitions and conditions, the present paper is difficult to understand without any knowledge of the aforementioned earlier papers. There are 1 figure and 6 references, 4 Soviet references.

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainiskoy  
SSR (Institute for Radiophysics and Electronics of the  
Academy of Sciences of the UkrSSR)

SUBMITTED: April 27, 1958

Card 2/2

20-119-3-19/65

AUTKOR: Kaner, E. A.

TITLE: Cyclotron Resonance in Films (Tsiklotronnyy rezonans v plenkakh)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 3, pp. 471-474 (USSR)

ABSTRACT: This work gives the results of the computation of the surface impedance of a monocrystalline metal film of the thickness  $d$  in the case of strongly anomalous character of the skin effect. Then the effective depth of the attenuation of the current  $\delta_{eff} = (c^2|Z|/2\pi\omega)$  is small compared with all the other parameters of the dimension of a length: The maximum radius of the orbit  $r$ , the free length of path  $l$ , the thickness  $d$  of the film. Here the free length of path of course is assumed to be the greatest of these parameters. At  $d \gg 2r$  ( $d - 2r \gg \delta_{eff}$ ) the electrons, which take part in the resonance, do not "know" anything about the existence of the second boundary of the film and the surface impedance of the film in this case coincides with the impedance of the massive metal (with an accuracy to terms of the order  $\exp(-d/\delta_{eff})$ ). At  $d < 2r$  that part of the electrons, the orbit diameter of

Card 1/4

20-119-3-19/65

Cyclotron Resonance in Films

which in the magnetic field is equal to  $2q \pm 2r \sin \phi \frac{d}{d}$  (whereby  $\phi$  denotes the angle between the direction of  $H$  and of the velocity  $\vec{v}$  of the electron), has collisions with both parts of the film and therefore they do not take part in the resonance. (On this occasion a diffuse scattering of the electrons is assumed). The rest of the electrons the velocity of which encloses a small angle with the magnetic field ( $2q < d$ ), as before do not "know" anything about the second boundary and give the same contribution to the resonance as also in the case of a massive sample. If one starts with such a physical explanation of the phenomenon, the formulae given in this work, for the current density and for the surface impedance of the film can be understood with ease. These formulae were ascertained by strict solution of the equations of the problem. The complete system of the equations consists of the Maxwell equation and of the kinetic equation for the additional term to the Fermi distribution function. The formulae, found here, are exact and are valid at arbitrary angles of inclination of  $H$  relatively to the film and in case of arbitrary relationships between the parameters, which occur in these formulae. In a film of the thickness

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# Cyclotron Resonance in Films

$d \ll 2r$  a peculiar anisotropy of the surface impedance with regard to the polarisation of the incident wave exists:  $Z_{xx} \neq Z_{yy}$ . Such a polarisation does not exist in a massive metal. At  $2r \sim d$  a resonance with regard to the effective mass must be absent. And above all the resonance with regard to the extreme effective masses is suppressed, if the orbit diameter for the corresponding electrons is greater than  $d$ . The influence of the shape of the sample upon the shape of the cyclotron resonance essentially can facilitate the harmonic analysis of the resonance curves. All here found conclusions are valid only for a certain angle of inclination of the magnetic field to the surface of the film, for in case of wide angles of inclination resonance does not exist. A consideration of the non diffusion-like character of the scattering of the electrons at the boundaries of the film does not change the results. Finally the author thanks I. M. Lifshits and M. I. Kaganov for the control of the results, which were obtained here. There are 1 figure and 7 references, 4 of which are Soviet.

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20-119-3-19/65

Cyclotron Resonance in Films

ASSOCIATION: Nauchno-issledovatel'skiy institut radiofiziki i elektroniki  
Akademii nauk USSR (Scientific Research Institute of Radio-  
physics and Electronics AS Ukrainian SSR)

PRESENTED: November 31, 1957, by L. D. Landau, Member, Academy of  
Sciences, USSR

SUBMITTED: October 30, 1957

AVAILABLE: Library of Congress

Card 4/4

KANER, E. A.

В. В. Канер

Анализ связи шифровального преобразования частот

II. СЕКЦИЯ РАССПРОСТРАНЕНИЯ РАДИОВОЛН  
Руководитель А. А. Шварц

9 часов  
(с 10 до 12 часов)

Секционные заседания и личный кабинет руководителя

А. В. Шварц,  
В. В. Губин

Изучение работы сектора радиотехники связи при рассмотрении радиотехники СВЧ

А. В. Шварц,  
Г. В. Сидоров,  
В. В. Губин

Изучение работы сектора радиотехники связи при рассмотрении радиотехники СВЧ

В

(с 12 до 14 часов)

В. В. Канер,  
В. В. Губин

О состоянии работы сектора радиотехники связи при рассмотрении радиотехники СВЧ

А. В. Шварц

К работе и развитию сектора радиотехники связи при рассмотрении радиотехники СВЧ

В. В. Канер,  
В. В. Губин

К работе радиотехники связи при рассмотрении радиотехники СВЧ

9 часов  
(с 10 до 12 часов)

А. В. Шварц,  
Г. В. Сидоров,  
В. В. Губин

Секционные заседания сектора радиотехники связи при рассмотрении радиотехники СВЧ

Report submitted for the Combined Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications in A. S. S. S. R. (USSR), Moscow, 6-10 Feb. 1959



69948

SOV/141-2-4-3/19

9,9000

AUTHORS: Kaner, E.A., and Bass, F.G.

TITLE: Propagation of Electromagnetic Waves <sup>21</sup> in a Medium With  
Random Irregularities Placed Above a Perfectly Conducting  
Plane

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,  
1959, Vol 2, Nr 4, pp 553 - 564 (USSR)

ABSTRACT: Formulae are derived for the main statistical characteristics (average field, amplitude and phase fluctuations) and their dependence on the frequency and polarization of radio waves and the distance and height of the receiving and transmitting aerials. In order to have a complete statistical description of the radiation field, it is necessary to know the distribution function  $f(\delta\epsilon)$  of the random deviations  $\delta\epsilon$  of the dielectric constant from the average value  $\bar{\epsilon}$  which for simplicity was taken as unity. However, at present the theory does not give an unambiguous answer to the problem of the distribution of  $\delta\epsilon$ . If one considers that this distribution is normal and takes only small fluctuations,

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Propagation of Electromagnetic Waves in a Medium With Random Irregularities Placed Above a Perfectly Conducting Plane

then in order to obtain a complete statistical description it is sufficient to know only the second moment of  $f(\delta\epsilon)$  or the correlation function  $\delta\epsilon(\underline{r}_1)\delta\epsilon(\underline{r}_2)$ . It

is assumed that the correlation function is of the form given by Eq (1.1), where  $\delta\epsilon$  is independent of the coordinates (statistically uniform medium) and the coefficient  $W$  depends only on the moduli of the differences between the components of the vectors  $\underline{r}_1$

and  $\underline{r}_2$ . The distribution function of each of the components of the field  $E = E_r + iE_i$  ( $E_r$  and  $E_i$

are the real and imaginary parts of  $E$ ) is taken to be of the form given by Eq (1.2), where the symbols involved are defined by Eq (1.3). Using this formula, it is shown that away from the minima of the mean field, i.e. when  $\overline{\epsilon^2} \ll |\overline{E}|^2$ , the mean phase is given by Eq (1.4). The

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mean square phase fluctuation is given by Eq (1.5), the mean amplitude by Eq (1.6), the mean square of amplitude fluctuation by Eq (1.7) and the mutual correlation between the amplitude and phase by Eq (1.8). Thus, a complete description of the radiation field is obtained if the mean field and the corresponding mean square values are known. In order to calculate these quantities, use is made of Maxwell's equations which, after the exclusion of the magnetic field, can be reduced to the form given by Eq (2.1). Assuming that  $\epsilon = 1 + \delta\epsilon$ ,  $\underline{E} = \underline{E} + \underline{\xi}$ , the final equations are of the form given by Eqs (2.3) and (2.4). These equations must be supplemented by the appropriate boundary conditions on the separation boundary. If the latter is a perfectly conducting plane, the tangential components of the field must be zero (Eq 2.5). The subscript "0" indicates that the quantities are evaluated at  $z = 0$ , where the  $z$  axis is normal to the separation boundary and passes

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through the point  $z_0$  at which the radiator is located.

The  $x$  axis passes along the projection of the line connecting the point of observation  $r(L,0,z)$  with the radiator  $r_0(0,0,z)$ . The boundary condition for the

vertical component  $E_z$  is given by Eq (2.6). It is

assumed that  $|\nabla \delta \epsilon| \ll k |\delta \epsilon|$  or  $k |\delta \epsilon| \gg 1$ , in which case polarization corrections can be neglected. Accordingly, the vector equations (2.3) and (2.4) can be reduced to the form given by Eqs (2.7) and (2.8), subject to the boundary condition given by Eq (2.9). The  $\delta$  function on the right-hand side of Eq (2.7) is due to the presence of the source at the point  $r_0$ . These equations are solved

for the mean field in Section 3, and it is shown that in order to find this field above the perfectly conducting plane, it is sufficient to replace the propagation

constant  $k$  by the quantity  $\kappa = k \sqrt{\epsilon_0 + \delta \epsilon}$  in which

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$\epsilon_{30}$  is given by Eq (3.11) (Which is the same as the value of  $\epsilon_{30}$  in an infinite medium - Ref 5). Section 4 is concerned with the statistical characteristics of the field in the distant zone. In this section, formulae are derived for the mean square fluctuations mentioned above. It is shown that the fluctuations increase rapidly near the minima of the mean field and this is associated with the interference structure of the electromagnetic field in space. The interference effects are most sharply defined when the amplitude of the direct and the reflected waves is the same. If the modulus of the amplitude reflection coefficient is different from unity, the interference phenomena do not lead to such a strong increase in the fluctuations. In the case of small reflection coefficients one can use the formulae obtained for an infinite medium. If the correlation function can be approximated by a formula of the form  $\delta \epsilon^2 \exp \left[ - (x^2 + y^2)/l_{\parallel}^2 - z^2/l_{\perp}^2 \right]$ .

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69949

SOV/141-2-4-4/19

AUTHORS: Bass, F.G. and Kaner, E.A.

TITLE: Correlation of Electromagnetic Field Fluctuations in a Medium Having Random Irregularities and Placed Above a Perfectly Conducting Plane

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 4, pp 565 - 572 (USSR)

ABSTRACT: The present paper is the continuation of the paper on pp 553-564 of this issue. Using the results obtained in that paper, general formulae are derived for the spatial correlation functions for amplitude and phase fluctuations, assuming that the relative fluctuations are small. If the fluctuation part of the electromagnetic field is much smaller than the regular component (at points distant from the zeros of the latter) the phase and amplitude fluctuations are given by Eqs (1.1) and (1.2). The correlation between the amplitude and phase fluctuations at different points 1 and 2 is then given by Eqs (1.3) and (1.4). Under certain simplifying assumptions, it can be shown that the phase and amplitude correlations are equal and are given by Eq (1.5).

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SOV/141-2-4-4/19

Correlation of Electromagnetic Field Fluctuations in a Medium Having Random Irregularities and Placed Above a Perfectly Conducting Plane

Thus, the phase and amplitude correlation functions are completely defined by the quantity

$\zeta_1 \zeta_2^*$ . Using Eq (1.6) derived in the previous paper,

it can be shown that  $\zeta_1 \zeta_2^*$  is given by Eq (1.7). This equation is then used to calculate the correlation for two special cases, namely, the case of transverse and longitudinal correlation. There are 3 Soviet references.

ASSOCIATION: Institut radiofiziki i elektroniki AN USSR  
(Institute of Radiophysics and Electronics of the  
Ac.Sc. Ukrainian SSR)

SUBMITTED: March 19, 1959

Card 2/2

58557

S/141/59/002/05/021/026  
E032/E314

9.9000

AUTHOR: Kaner, E.A.

TITLE: On the Theory of Propagation of Waves in a Medium With  
Random Irregularities

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,  
1959, Vol 2, Nr 5, pp 827 - 829 (USSR)

ABSTRACT: The total system of equations describing the propagation  
of electromagnetic waves in a medium with small fluctuations  
of  $\epsilon$  in the dielectric constant  $\epsilon$  about the mean value  
equal to unity, is given by Eqs (1), where  $\underline{D}$  is the  
induction,  $\underline{E}$  and  $\underline{H}$  are the electric and magnetic  
fields (the medium is non-magnetic) and  $c$  is the  
velocity of light in vacuo. The connection between  $\underline{D}$   
and  $\underline{E}$  is assumed to be of the form given by Eq (2).  
Eliminating  $\underline{H}$  from Eq (1), one obtains Eq (3). In  
this equation, the bar denotes an average of  $\delta\epsilon$ . The  
statistical averaging of Eq (3) leads to Eq (4).  
Usually, the last term in Eq (4) is neglected because it  
is small. To calculate  $\overline{\delta\epsilon}$  it is necessary to find  $\xi$ .  
The equation for the latter quantity can be obtained by

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On the Theory of Propagation of Waves in a Medium With Random Irregularities

subtracting Eq (4) from Eq (3) and this leads to Eq (5). In the determination of  $\xi$  and  $\xi\delta\epsilon$  the difference  $\xi\delta\epsilon - \xi\delta\epsilon$  can be neglected. It is assumed that the field is monochromatic ( $\sim \exp(-i\omega t)$ ) and the dependence of  $\delta\epsilon$  on time is neglected. In that case the solution of Eq (5) is given by Eq (6), where  $T_{ik}(r)$  is the Green tensor given by Eq (7). Substituting Eq (6) into Eq (4), one obtains Eq (8). An expression is then sought for the effective dielectric constant  $\epsilon_{eff}$  which depends on the propagation constant as given by Eq (9). If the medium is considered to be isotropic, then Eq (11) is obeyed and the quantity  $a(x)$  can easily be calculated and the equation for the effective dielectric constant is of the form given by Eq (12), where  $W$  is the correlation coefficient. Analysis of these expressions shows that if

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On the Theory of Propagation of Waves in a Medium With Random Irregularities

$\sqrt{\mu^2} kl \ll 1$  ( $l$  is the correlation radius and  $\mu$  is the fluctuation in the refractive index), then the quantity  $\kappa$  in Eqs (12) and (13) can be replaced by  $k$ . Even with this limitation, the limiting case  $kl \gg 1$  is still possible (because  $\mu$  is small). Table 1 gives formulae for  $\epsilon_{300} - 1$  with the absorption coefficient  $\alpha = k \text{Im } \epsilon_{300}$  and the relative change in the phase velocity  $-\Delta v_{300}/c = (1 - \epsilon_{300}^{1/2})$  for two limiting cases for

both electromagnetic and sound waves. The quantity  $\overline{I}^n$  ( $n = 1, 2, 3$ ) in the table denotes the integral:

$$\int_0^{\infty} d\rho \rho^{n-1} w(\rho) .$$

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On the Theory of Propagation of Waves in a Medium With Random Irregularities

The last row in Table 1 refers to sound waves and the row above refers to electromagnetic waves.  
There are 1 table and 4 Soviet references.

ASSOCIATION: Kharkovskiy institut radiofiziki i elektroniki  
AN USSR (Khar'kov Institute of Radio-physics and  
Electronics of the Ac.Sc. Ukrainian SSR)

SUBMITTED: March 19, 1959

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Card 4/4

9 (9)

AUTHORS:

Kaner, E. A., Bass, F. G.

SOV/20-127-4-17/60

TITLE:

On the Statistic Theory of the Propagation of Radio Waves Over an Ideally Conducting Plane

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 4, pp 792 - 795 (USSR)

ABSTRACT:

In the present paper, the statistic characteristic electromagnetic field propagated in a medium with small random fluctuations  $\delta\epsilon$  of the dielectric constant  $\epsilon = \langle\epsilon\rangle + \delta\epsilon$  over an ideally conducting plane is calculated. It is assumed that the medium over the surface is statistically homogeneous, and that  $\langle\epsilon\rangle$  and  $\langle\delta\epsilon^2\rangle$  do not depend on time and on the coordinates. The problem is restricted to large-scale fluctuations, i.e. the correlation radius is large as compared with the wave length. For a complete statistic description of the field, the mean value of the field and the mean square of the fluctuation components must be found. In a limited medium, the fluctuations grow near the interference minimum of the field components. The theoretical results obtained in the consideration of the problem described are further dealt with. On the basis of the

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On the Statistic Theory of the Propagation of Radio Waves Over an Ideally Conducting Plane SOV/20-127-4-17/60

Maxwell equation and neglecting polarization corrections, the Maxwell equation is transformed into  $\Delta \vec{E} + k^2(\vec{E} + \langle \xi \delta \xi \rangle) = -p\delta(\vec{r} - \vec{r}_0)$ , (2). This method of statistic description was developed in the papers by Lifshits and collaborators (Ref 2). A solution is found which shows that at a sufficiently large distance from the source the distribution of the components  $\xi$  is normal at any distribution law of  $\delta \xi$ . In equation (2),  $\vec{E}$  denotes the regular and  $\xi$  the fluctuation components,  $k = \omega/c$ ,  $p = 4\pi k^2 d$ . At a distance  $L \gg kl^2$  from the interference minimum, the distribution of the phase and amplitude is a Gaussian distribution, near the minimum it is a distribution according to the law by Rayleigh. The conditions obtained mean that for a complete statistic description of the electromagnetic field it is sufficient to find the mean (regular) field and the mean square value of the fluctuations  $\xi_{\pm}(\vec{r}) = k^2 \int_{z>0} d\vec{r}' \varphi_{\pm}(\vec{r}, \vec{r}') E_{\pm}(\vec{r}') \delta \xi(\vec{r}')$

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On the Statistic Theory of the Propagation of Radio Waves Over an Ideally Conducting Plane SOV/20-127-4-17/60

for each field component. There are 3 references, 2 of which are Soviet.

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk SSSR (Institute of Radiophysics and Electronics of the Academy of Sciences, USSR)

PRESENTED: April 8, 1959, by M. A. Leontovich, Academician

SUBMITTED: April 4, 1959

Card 3/3

KANER, E.A.

**Theory** of the absorption of ultrasonic waves by metals in a strong magnetic field. Part 1. Zhur. eksp. i teor. fiz. 38 no.1:212-218 Jan '60. (MIRA 14:9)

1. Institut radiofiziki i elektroniki AN Ukrainskoy SSR.  
(Ultrasonic waves) (Magnetic fields)

*KANER, E. A.*

S/056/60/039/01/13/029  
B006/B070

AUTHORS: Azbel', M. Ya., Kaner, E. A.

TITLE: The Problem of the Experimental Investigation of Cyclotron Resonance in Metals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1 (7), pp. 80-87

TEXT: Up to now cyclotron resonance has been experimentally observed in seven metals: tin, lead, indium, bismuth (and its compounds with tin and thallium), copper, zinc, and aluminum. On this subject there exist many experimental and theoretical works. The aim of the present paper is to discuss the data in these publications and to compare them with the theoretical predictions. Some further possibilities of experimentally investigating cyclotron resonance in metals are also mentioned. The general theory of the effect is then given, and the determination of the effective carrier mass, the form of the resonance curve, and the law of dispersion are briefly dealt with. In the following, experimental facts are compared with theoretical predictions. The theoretically predicted

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The Problem of the Experimental Investigation  
of Cyclotron Resonance in Metals

S/056/60/039/01/13/029  
B006/B070

high sensitivity of the effect, and the parallelism of the constant magnetic field to the surface of the sample could in all cases be experimentally verified. For Zn, Sn, Cu, and Al a large number of harmonics could be established.  $dR/dH$  and not  $R(H)$  is often experimentally measured. The peculiarities of this method of measuring the field dependence of resistance are discussed and the curves  $R = f(H)$  and  $dR/dH = f(H)$  for a quadratic (Fig. 1) as well as a non quadratic (Fig. 2) law of dispersion are considered. Further, the determination of the resonance frequency by absorption minimum as well as by the maximum of its derivative with respect to  $H$  is discussed. The expression for the resonance surface resistance  $R_{res}$ , the derivative  $(dR/dH)_{res}$ , and the relative displacement of the minimum of  $R$  and maximum of  $dR/dH$  for a quadratic law of dispersion  $m(p_z) = \text{constant}$ , a non quadratic law with  $m(p_z) = \text{minimum}$ , and a non quadratic law with  $m(p_z) = \text{maximum}$  are given in a table. The anisotropy of the curves in the resonance region is considered and the dependence of the height of the maximum on the magnitude of the field strength is investigated for a quadratic dispersion law, as well as in the general case, and the experimental

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The Problem of the Experimental Investigation  
of Cyclotron Resonance in Metals

S/056/60/039/01/13/029  
B006/B070

results are compared with the theoretical ones. It is then pointed out that the dependence of absorption on the direction of polarization of a variable electric field, when the direction of  $\vec{H}$  is kept constant, has not yet been investigated. A few problems concerning Fermi surface are discussed, and it is shown that the solution given in Refs. 17 and 18 for the equation of motion of the electron in a magnetic field parallel to the metal surface does not satisfy the boundary conditions. In conclusion, the authors thank A. F. Kip, D. N. Langenberg, E. Fawcett and I. Phillips for making available the preprints before publication. P. A. Bezuglyy, A. A. Galkin, M. S. Khaykin, N. Ye. Alekseyevskiy and Yu. P. Gaydukov are mentioned. There are 2 figures, 1 table, and 37 references: 17 Soviet, 15 American, 3 British, and 1 Canadian. ✓B

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR  
(Physicotechnical Institute of the Academy of Sciences  
of the Ukrainskaya SSR)

SUBMITTED: December 16, 1959

Card 3/3

84415

S/056/60/039/004/033/048  
B006/B063

6.8000(3201,1099,1162)

24.1800

AUTHOR: Kaner, E. A.

TITLE: Theory of Absorption of Ultrasonic Waves by Metals in a  
Strong Magnetic Field. II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 39, No. 4(10), pp. 1071 - 1077

TEXT: A theory of magnetic absorption of ultrasonic waves by metals at low temperatures and the effect of the non-monotonic relationship between absorption coefficient and magnetic field in the range  $\lambda \leq r \ll 1$  ( $2\pi\lambda$  is the sound wavelength;  $r$  and  $l$  are the orbital radius and the free path of the electron, respectively) formed the subject of Part I of the present paper (Ref. 1), as well as of papers by V. L. Gurevich and by the author jointly with A. A. Galkin. Refs. 1 and 3 dealt only with the region of strong fields with  $r \ll \lambda$ . Following Ref. 1, the author now studies the asymptotic absorption of ultrasonic waves by metals with an open Fermi surface (especially those of the type of the "spatial network"), which are placed in strong magnetic fields. It is shown that the deformation absorption

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Theory of Absorption of Ultrasonic Waves by  
Metals in a Strong Magnetic Field. II

S/056/60/039/004/033/048  
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coefficient is saturated, irrespective of the existence of open trajectories. There exists a marked anisotropy of saturation which depends on a function of the position of the sound-wave vector with respect to the magnetic field vector and the direction of the open trajectory. The particular phenomena occurring in inductive absorption of ultrasonic waves in the presence of open Fermi surfaces are studied, and the asymptotic value of the conductivity tensor in a magnetic field is calculated by taking into account spatial dispersion. First, general formulas are given for the absorption coefficient (Section 2); the asymptotic deformation absorption in strong fields is briefly discussed, and the following three special cases are described in detail:  $\vec{k}\vec{v} \equiv 0$ ;  $\vec{k}\vec{v} \neq 0$ , but may vanish at certain values of  $p_z$ ;  $\vec{k}\vec{v}$  never vanishes (Section 3). The asymptotic

behavior of the  $\sigma$ -tensor and the deformation current are described in section 4. Finally, the anisotropy of absorption in a strong magnetic field is studied for the following special cases: a) The wave vector is parallel to the direction of the open trajectories; b)  $\vec{k}$  is perpendicular to  $\vec{H}$ ; c)  $\vec{k}$  lies in the  $xz$ -plane; d) the direction of  $\vec{k}$  is arbitrary (Section 5). A comparison between theory and experiment will be given in a

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